Chinese super-rat roamed Earth 160 million years ago

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Like most early nocturnal mammals, *Rugosodon eurasiaticus* was active at night. This reconstruction shows *Rugosodon* searching for food among ferns and cycads on the lake shores in the darkness. Credit: April Isch, University of Chicago

A fossil of the oldest known ancestor of modern rats—an agile creature that could climb, burrow and eat just about anything—has been unearthed in China, scientists said Thursday.

The newly named species Rugosodon eurasiaticus had flexible ankles for tree-climbing and sharp teeth that could gnaw both animals and plants, according to the journal *Science*.

These adaptations helped the ancient rat-like rodents known as multituberculates become among the longest lived mammals in history, said the study led by Chong-Xi Yuan from the Chinese Academy of Geological Sciences in Beijing.

Believed to originate 160 million years ago during the Jurassic Period, they lived for some 100 million years in the age of the dinosaurs before modern rodents overcame them.

Their abilities also led to their evolution and diversification into a range of tree-dwelling and plant-eating mammals that followed, said the researchers from China and the United States.

"Some could jump, some could burrow, others could climb trees and many more lived on the ground," said co-author Zhe-Xi Luo of the University of Chicago.

"The tree-climbing multituberculates and the jumping multituberculates had the most interesting ankle bones, capable of 'hyper-back-rotation' of the hind feet."

The latest fossil was found in the Jurassic Tiaojishan Formation in eastern China.

The fossil of *Rugosodon eurasiaticus* is preserved in two shale slabs in part (left) and counterpart (right). It is about 17 cm (6.5 inches) long from head to rump, and is estimated to have weighed 80 grams (about 2.8 ounces). The sediments at the site of discovery are lake sediments with embedded volcanic layers. The fossil assemblage of *Rugosodon* also includes feathered dinosaur *Anchiornis* and the pterosaur *Darwinopterus*. By the dental features, *Rugosodon eurasiaticus* closely resembles the teeth of some multituberculate mammals of the Late Jurassic of the Western Europe, suggesting that Europe and Asia had extensive mammal faunal inter-changes in the Jurassic. Credit: Zhe-Xi Luo of University of Chicago and Chongxi Yuan of Chinese Academy of Geological Sciences

Its name comes from the Latin "rugosus" for wrinkles and "odon" for tooth, because of its bumpy molar surface and "eurasiaticus" for its widespread territory.

Luo said the fossil is similar to those found in Portugal, suggesting that it

and its relatives were widely found across the entire Eurasian continent.

The creature was believed to have a body mass of about 65 to 80 grams (2.3-2.8 ounces).

Researchers said the tooth and ankle adaptations likely evolved very early in the creatures' existence, helping them to become so long-lived as a group.

More information: "Earliest Evolution of Multituberculate Mammals Revealed by a New Jurassic Fossil," by C.-X. Yuan et al. *Science*, 2013.